drawings in conformance with approved changes upon allowance of the case.

Specification

The proposed amendments to the specification regularize the use of "employee" in the specification. Although "clerk" would be equally proper, use of a single term reduces possibility of misunderstanding. In response to the examiner's objection under 37 CFR 1.75(d)(1) and MPEP 608.01(o), appropriate language corresponding to the language used in the claims has been added or emphasized. The claims have also been clarified in a similar manner. It is believed that the amendments address each point of objection raised by the examiner and that this grounds for objection should be withdrawn.

Claims Rejection - 35 USC 112

The examiner has rejected the claims under 35 USC 112, and has identified a defect in line 8 of Claim 1. The phrase "an arm" has been changed to --said extended arm-- in claim 1 and similar changes have been made in claims 2 and 3. The examiner also identified a grammatical error in line 3 of claim 15, which has been corrected by changing "inhibit" to --to prevent--. It is believed that the amendments address each point of rejection raised by the examiner and that this grounds for rejection should be withdrawn.

Section 103 Rejections

The Examiner has rejected claims 1-5, 7, 9 -12 and 16 under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art of figure 5 in view of Jonsson. Further, the examiner has rejected claims 13-15 under 35 U.S.C. 103(a) over the admitted prior art of figure 5 in view of Jonsson and further in view of Hagenbrook.

The examiner has alleged that the applicant has made a statement to the

effect that the sensors of Figure 5 pointed "upwardly" and has directed applicant's attention to page 6 of the response of July 19, 2000. Applicant cannot locate any such statement and respectfully requests the examiner to specifically identify any confusing expression so that it can be corrected. Applicant notes that line 26 of page 6 should read --"upwardly directed" sensor-- rather than "'horizontally directed' sensor", but this statement had reference to the Jonsson patent, not Figure 5, and states the applicant's position that the Jonsson sensors do not fall within the meaning of the term. The examiner does not seem to have been misled on this point by this typographical error. When the examiner identifies the source of the confusion, Applicant requests an opportunity to clarify the record. Applicant does not believe that Figure 5 illustrated upwardly directed sensors.

Applicants propose amending Claims 1, 2 and 3, the independent claims in the case, to include limitations heretofore considered by the examiner in connection with claim 11. Applicants believe that this language clearly structurally distinguishes over the art, as will be explained below. Moreover, entry of the amendment will simplify the issues on appeal. Applicants respectfully request, therefore, that the amendment be entered.

Addressing claims 13-15 first, applicants respectfully submit that the examiner has not made a prima facie case for rejecting these claims. In the first place, Hagenbrook does not disclose a proximity sensor. The Hagenbrook apparatus is a light beam projection system. The light source is in one housing and a receiver is in another and the interruption of the direct beam between the two elements triggers the door mechanism. A proximity sensor emits a radiation that is reflected from an object or person into a receiver.

The lamp 93 is not a sensor. It emits radiation, but is completely passive, and cannot, of itself, sense anything.

To the extent that there is a sensor system in Hagenbrook, that system certainly comprises the lens system 30 that extends beyond a lip (unlabeled) as can be seen in Fig. 3. Claim 13 does not say that the ring rises above a part of the sensor; it says that the ring rises above the sensor. The apparatus of Hagenbrook does not meet these limitations.

Nor does the apparatus of Hagenbrook show a sensor comprising an LED emitter and a receiver wherein the ring rises above the sensor a distance sufficient for light emitted by the emitter to reflect off an object in contact with the ring and be received by the receiver (claim 14).

Applicants want to clarify what the applicants believe occurs as an employee approaches and uses the window of the invention. An employee using a service window reaches towards the window, extending an arm and hand, either to receive something from the customer (e.g., payment) or to deliver goods. The window opens when this action is sensed, before the torso of the employee comes into the field of the sensors. The employee may continue to move forward after the window opens and actually lean through the window, thus belatedly bringing her torso into the sensing field. The window, however, has opened when the employee's arm alone was detected. Leaning further forward, the employee may actually touch the sensors, for instance, with her stomach. Proximity sensors usually comprise a radiation source, one or more lenses and a receiver. Radiation leaves the source, may be focused by lenses, encounters the object to be sensed and returns through optional lenses to the receiver. The sensitivity of the receiver is set so that radiation reflected or emitted by the background is not recognized as a sensed object. If radiation leaving the source is blocked from returning to the receiver, e.g., by a shirt or body part, the sensor will fail to recognize the presence of an employee. This problem is particularly presented by upwardly pointed proximity sensors mounted adjacent a service

window, as taught in this application. It is one of the reasons that a designer would be dissuaded from arriving at the claimed invention. The art cited by the examiner does not show or suggest a proximity sensor surrounded by a ring which rises above the sensor (claim 13), or a proximity sensor comprising an led emitter and a receiver and wherein the rung rises above the sensor a distance sufficient for light emitted by the emitter to reflect off an object in contact with the ring and be received by the receiver (claim 14), or a proximity sensor having a lens with a projection extending beyond the lens a distance sufficient to inhibit objects approaching the lens from disabling the functioning of the proximity sensor (claim 15). Claims 13, 14 and 15 should be allowed.

Claim 1 and its dependent claims 5, 11-12 and 16 are rejected over the admitted prior art of Figure 5 in view of Jonsson '912. Applicants respectfully request that the limitation of claim 11 by incorporated into claims 1, 2 and 3, as set forth in the proposed amendment above. This structure is not shown by the combination of art cited by the examiner, and the proposed amendment will simplify the issues on appeal, should the examiner maintain the rejection of the claims.

As a preliminary matter, applicants would respectfully note that the prior art of figure 5 does NOT show a proximity sensor, contrary to the assertion of the examiner in this action. Figure 5 shows a light beam type sensor wherein the employee must place a part of his body between a light source or emitter 61 and a receiver or detector 62 and must stay there to keep the window open. When the employee leans forward to deliver product, her waist may shift away from the window, thus keeping the employee's center of gravity over the employee's feet. This natural motion can move the employee's body out of the light path and cause the window to close just as the employee is reaching towards a customer.

Nevertheless, proximity sensors have been used with service windows, as

pointed out heretofore in connection with the Realtec apparatus. This art, which has been presented to the examiner before, and additional examples of use of proximity sensors with service windows, presented here by affidavit, show outwardly or downwardly directed proximity sensors, not sensors focused upward at an angle that deviates from a vertical direction by not more than about 10°. The actual use of proximity sensors with service windows extends from at least 1989. Nevertheless, no one has proposed the configuration claimed by applicants.

The examiner argues that Jonsson '912 may be combined with Fig. 5 to produce the claimed invention. Applicants respectfully disagree. To the extent any ambiguity remains in claims 1, 2 or 3, the limitations of claims 11, which applicants propose incorporating into these claims, clearly distinguish over the art, as will be discussed below. Applicants will discuss Jonsson '912 first.

Applicants have heretofore submitted evidence for the proposition that applicant's invention is not obvious. The examiner has requested more detailed evidence of a long-felt need. Applicants submit additional evidence herewith, including, but not limited to, Jonsson '914 itself.

Applicants submit that it has long been recognized that automatic doors may open or close at inappropriate times. In particular, where automatic doors are controlled by proximity sensors, the sensors are usually sensitive to the reflectivity, e.g., the color or shape, of the person or object approaching the door. This problem is expressed and recognized, for instance, in US Patent 4, 029,176 to Mills. The inventor stated that one of the objects of his 1975 invention was: ". . . to provide an improved apparatus for detecting substantial objects of any nature without regard to their electrical or physical properties, texture, temperature, color, shape or motion." (Col. 3, line 16-20.) The inventor's

proposed solution is an ultrasonic proximity sensor directed horizontally or downwardly.

The Jonsson '914 patent clearly establishes that false opening and closing of doors, particularly doors controlled by proximity sensors, was a known problem at least as early as May 1979, the priority date of Jonsson '914. Jonsson '914 is derived from a Swedish application filed in May 1979. This application resulted in a series of US patents including US 4,467,251, US 4,888,532, and US 4,590,410. The earliest of this series, US 4,467,251, was published by the Patent Office on August 21, 1984. The disclosure of the Jonsson '914 patent has, therefore, been available in English in the United States since at least 1984 and no one, before applicants, made the combination suggested by the examiner, nor the further modifications suggested by the examiner to meet the limitations of the claims.

Jonsson '914 (and Jonsson ' 251) explain the problem of false openings and closings in some detail at column 5, beginning at line 6:

> . . . In this respect, the sensing apparatus of FIG. 1 is preferred to the conventional reflection type object sensing apparatus by reason of the fact that it is less susceptible to variations in object detecting range with variation in radiation reflectivity of the object. Prior art reflective object sensing apparatus makes use of a focused or collimated beam of light, which is directed outward in the direction from which an object is anticipated to approach. The radiation is reflected off the object and received by a sensing apparatus which also has a relatively narrow focused beam which is oriented in the identical direction. The range at which the object will be sensed by this type of apparatus will depend largely on the reflectivity of the object. An object such as a retro-reflecting device, which sends back a relatively focused beam of radiation toward the emitter will cause a very large response in the receiving device and may be detected at a very large range. An object of irregular shape which has relatively low reflectivity, such as a dull black overcoat, will not be detected until it is very close to the radiation detector. . . .

The solution to this problem proposed by Jonsson is not upwardly pointed proximity sensors. Jonsson teaches a diffuse lighting system wherein light from one or more emitters is received by one or more receivers. The emitters and receivers are spaced apart from each other to allow this rather wide light path. As explained in column 6, lines 4-28, Jonsson believed that this arrangement would solve the problem of inappropriate opening and closing caused by different reflectivity (e.g., dark or light clothing) because diffuse light from multiple emitters could be received by multiple receivers.

In Column 6, line 55-68, Jonsson explains that in the illustrated embodiment, the sensors are mounted about 15 inches above the floor, ". . .to detect objects near the bottom of the door." (Col. 6, line 67-68.) The sensors are oriented "slightly upward from horizontal direction." (Col. 6, line 62-63.) A person of ordinary skill in the art, reading Jonsson, would be taught that proximity sensors, even those mounted near the bottom of a door, could be tilted upward no more than slightly upward from horizontal direction, so that they would continue to detect objects near the bottom of the door. In fact, it has been suggested that sensors oriented slightly above the horizontal direction would nevertheless fail to detect small objects near the floor. Commenting on Jonsson '912, Tsutsumi et al., (US Patent 5,963,000) stated that " . . . the system of U.S. Patent No. 4,560,912 sometimes cannot detect a small object, e.g., an infant, on or near the floor." (Col. 1, lines 53-55.) Tsutsumi et al. then provides a plurality of downwardly pointed proximity sensors. Clearly, one of ordinary skill in the art would understand Jonsson as teaching the importance of detecting objects near the floor. One might even question the effectiveness of orienting sensors slightly above the horizontal direction. One would certainly not direct the sensors upward at an angle that deviates from a vertical direction by not more than about 10°, where the sensors could not detect objects near the floor and where they would not be initially detecting the torso of a person approaching the door.

US Patent 4,851,746 to Milke is also concerned with the problem of false openings and closings in proximity sensor controlled automatic doors. In discussing the Jonsson series of patents ('410, '912, and '251), Milke explained that the solution proposed by Jonsson was a plurality of emitters that ". . . generate diverging beams of diffuse (rather than focused) radiation . . . " (Col. 2, line 29-30.) Milke then again provides a plurality of downwardly or horizontally directed proximity sensors. Thus Milke provides further evidence that one of ordinary skill in the art, aware of both the problem of accurate detection and of the Jonsson reference, would not make the claimed invention with proximity sensors focused upward at an angle that deviates from a vertical direction by not more than about 10°.

The same can be said of US Patent 4,577,437 to Gionet et al. (of record in the case). Gionet et al. were aware of Jonsson '251. Jonsson '912 is a division of Jonsson '251 issued after the November 26, 1984 filing date of Gionet et al. Gionet et al. is also concerned with the problem of false openings and closings in proximity sensor controlled automatic doors. Once again, despite knowledge of the problem and of the Jonsson reference, Gionet et al. directed their proximity sensors down or horizontally. They explained:

> By appropriate tuning of the respective beams emanating from the microwave motion detectors above the door and on opposite sides of the door, they can effectively perform their intended functions without being activated by the door frames, floor, wall or other structures in connection with which the door and doorway are disposed. (Col. 2, line 9-16.)

This identical problem of over or under sensing caused by the differences in employee's clothing colors was observed by James Epps when he tried to design a proximity sensor activated service window. As set forth in the accompanying declaration, In 1990, James Epps, Robert Kramer, Jack Weaver and Mark Neubauer at M.C.E. Systems Corporation (now, Quikserv Corporation) tried to

develop a fast food service window with proximity sensors. Relying on the example of doors using proximity sensors, they used a sensor that was directed generally horizontally, to be triggered by the torso of an employee. They found that horizontally directed sensors were not satisfactory. The area around a fast food service window is a "noisy" environment. That is, there are many false signals in the area. Unlike a door, the employee stays in the general area of the window, taking orders, getting food items and performing other tasks. Proximity sensors aimed to sense the torso of the employee opened the widow at undesirable times.

Moreover, they found that the range of the horizontally directed sensors cannot be set sufficiently accurately for this environment. A light-emitting proximity sensor is sensitive not only to the distance of an approaching person, but also to the color of a reflecting surface. A person wearing light colored clothing is detected sooner and more frequently than a person wearing dark clothing. Sensors directed to detect the torso of an employee therefore respond differently to different stimulations. If the sensitivity of the sensor is diminished, to avoid oversensing, employees in dark clothing may be undersensed or not sensed at all. If the sensitivity of the sensor is increased, employees in light clothing may trigger false openings even when not wanting at the window to open. This is the same problem identified by Jonsson.

Quikserv tried to place widows with horizontally directed sensors with Burger King, Jack-in-the-Box and others, but there were so many complaints that they had to withdraw the windows from their offerings.

James Epps is also familiar with other proximity sensor-operated service windows sold in the United States, such proximity sensor-operated service windows from Realtec Equipment Inc. These windows have been offered for sale

since at least 1989. Another attempt by the industry to use proximity sensors in service windows were windows offered by Horton Automatics from at least 1989. These windows featured downwardly directed sensors mounted above the service window. These sensors still detect the torso of the employee when the employee approaches the window. Each of these attempts by Quikserv, Realtec and Horton Automatics triggered widow openings by detecting the torso of the employee. They did not direct sensors into a region where the torso of the employee is not sensed before the window is opened. In the windows of Applicant's' invention, the window opens when the employee wants it to open by sensing an object (such as the employee's arm) directly above the sensors.

Prior to Applicant's invention, a person of ordinary skill in the art would have directed proximity sensors to detect the torso of an employee in order to open an automatic door or service window, whether taught by the patent literature or by actual devices made and sold in the United States, just as James Epps and others in the field of service windows did. The person of ordinary skill would not have directed proximity sensors upward at an angle that deviates from a vertical direction by no more than 10° because sensors so directed would not detect the torso of the employee until the service window had already opened. Moreover, in a service window, the possibility that product spills or an employee's body in contact with the sensor would disrupt the function of the sensor would dissuade the person of ordinary skill from directing proximity sensors upward at an angle that deviates from a vertical direction by no more than about 10°, as claimed herein.

The issue to be considered by the examiner is not merely whether a person of ordinary skill would combine the Jonsson configuration with a service window. Rather, one must further modify the structure to aim the sensors upward at an angle that deviates from vertical by no more than about 10°. As

set forth in the affidavits of James Epps, Tom Kirkaldy, Mark Neubauer, and Jackson Weaver, the person of ordinary skill would not make such a modification. The present invention represents a departure for the teachings and use in the art. Claims 1., 2 and 3 and their dependant claims should be allowed. Since the claimed structure is not shown in the art and since the examiner appears to be relying on personal knowledge to supply the claimed features, applicants respectfully request the examiner to provide evidence by affidavit to support this position. 37 CFR 1.104 (d) (2). Applicants further request the opportunity to present counter evidence, if necessary.

In view of the above remarks and amendments, it is believed that the application, upon entry of the requested amendments, will be in condition for allowance and the Examiner's prompt action in accordance therewith is respectfully requested. If the examiner feels that a telephone conference would be helpful in advancing the prosecution of this case, the undersigned attorney urges the examiner to call him.

12 APRIL 2001

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Appendix of Claims (With Amendments Shown)

1. (Twice amended) A fast-food service window comprising:

a window assembly with at least one movable window member;

a window operator assembly mechanically coupled to the movable window member;

an upwardly focused proximity sensor sensors focused upward at an angle that deviates from a vertical direction by not more than about 10° and functionally coupled to the window operator assembly and directed to detect an extended arm of a person over said proximity sensor;

wherein the movable window member opens whenever [an] said extended arm of said person is sensed by said proximity sensor.

2. (Twice amended) A fast-food service window comprising:

a window assembly with at least one movable window member;

a window operator assembly mechanically coupled to the movable window member;

a plurality of upwardly focused proximity sensors focused upward at an angle that deviates from a vertical direction by not more than about 10° and functionally coupled to the window assembly and directed to detect an extended arm of a person over at least one of said proximity sensors ;

wherein the movable window member opens whenever [an] said extended arm of said person is sensed by said proximity sensors.

3. (Twice amended) A fast-food service window comprising:

a window assembly with at least one movable window member;

a window operator assembly mechanically coupled to the movable window member;

a upwardly focused infrared proximity sensor sensors focused upward at an angle that deviates from a vertical direction by not more than about 10° and electrically coupled to the window operator assembly and directed to

detect an extended arm of a person over said proximity sensor;

wherein the movable window member opens whenever [an] said extended arm of said person is sensed by said infrared proximity sensor.

4. The fast food service window set forth in claim 3 wherein said movable window member is opened when an upwardly focused infrared beam is detected by the proximity sensor and is closed when the infrared beam is not detected by the proximity sensor.

5. The fast-food service window set forth in claim 1 wherein the sensor has an integral infrared emitter and receiver.

6. Canceled.

7. The fast-food service window set forth in claim 2 wherein each of the sensors has an integral emitter and receiver.

8. Canceled.

9. The fast-food service window set forth in claim 3 wherein the sensor has an integral emitter and receiver.

10. The fast-food service window set forth in claim 3 wherein the infrared sensor emits an infrared beam at angle askew of the vertical plane.

11. [Canceled] The fast-food service window set forth in claim 1 wherein the proximity sensor is focused upward at an angle that deviates from a vertical direction by not more than about 10□.

12. [Amended] The fast-food service window set forth in claim 1 wherein the proximity sensor is directed such that the torso of a person approaching the

window is not detected by the proximity sensor before said extended arm is detected.

13. The fast-food service window set forth in claim 1 wherein the proximity sensor is surrounded by a ring which rises above the sensor.

14. The fast food service window set forth in claim 13 wherein the proximity sensor comprises an LED emitter and a receiver and wherein the ring rises above the sensor a distance sufficient for light emitted by the emitter to reflect off an object in contact with the ring and be received by the receiver.

15. (Amended) The fast food service window set forth in claim 1 wherein the proximity sensor has a lens and a projection extending beyond the lens a distance sufficient inhibit objects approaching the lens from disabling the functioning of the proximity sensor before said extended arm is detected.

16. [Amended] The fast food service window set forth in claim 1 wherein said window has a bottom frame member and said proximity sensor is mounted adjacent said bottom frame member and is directed upward at an angle sufficient to [avoid] permit detection of an extended arm of a person approaching the window before detection of the torso of [a] said person approaching said window.

17. [Canceled] A method of controlling a fast food service window comprising

providing an automated window assembly with at least one movable window member;

focusing a proximity sensor upward from below said window;

sensing only upper limbs of a person extended over said proximity sensor, and

controlling said movable window in response to said proximity sensor.

Appendix of Claims (After Amendments)

1. A fast-food service window comprising:

a window assembly with at least one movable window member;

a window operator assembly mechanically coupled to the movable window member;

an upwardly focused proximity sensor sensors focused upward at an angle that deviates from a vertical direction by not more than about 10° and functionally coupled to the window operator assembly and directed to detect an extended arm of a person over said proximity sensor;

wherein the movable window member opens whenever said extended arm of said person is sensed by said proximity sensor.

2. A fast-food service window comprising:

a window assembly with at least one movable window member;

a window operator assembly mechanically coupled to the movable window member;

a plurality of upwardly focused proximity sensors focused upward at an angle that deviates from a vertical direction by not more than about 10° and functionally coupled to the window assembly and directed to detect an extended arm of a person over at least one of said proximity sensors ;

wherein the movable window member opens whenever said extended arm of said person is sensed by said proximity sensors.

3. A fast-food service window comprising:

a window assembly with at least one movable window member;

a window operator assembly mechanically coupled to the movable window member;

a upwardly focused infrared proximity sensor sensors focused upward at an angle that deviates from a vertical direction by not more than about 10° and electrically coupled to the window operator assembly and directed to

detect an extended arm of a person over said proximity sensor;

wherein the movable window member opens whenever said extended arm of said person is sensed by said infrared proximity sensor.

4. The fast food service window set forth in claim 3 wherein said movable window member is opened when an upwardly focused infrared beam is detected by the proximity sensor and is closed when the infrared beam is not detected by the proximity sensor.

5. The fast-food service window set forth in claim 1 wherein the sensor has an integral infrared emitter and receiver.

7. The fast-food service window set forth in claim 2 wherein each of the sensors has an integral emitter and receiver.

9. The fast-food service window set forth in claim 3 wherein the sensor has an integral emitter and receiver.

10. The fast-food service window set forth in claim 3 wherein the infrared sensor emits an infrared beam at angle askew of the vertical plane.

12. The fast-food service window set forth in claim 1 wherein the proximity sensor is directed such that the torso of a person approaching the window is not detected by the proximity sensor before said extended arm is detected.

13. The fast-food service window set forth in claim 1 wherein the proximity sensor is surrounded by a ring which rises above the sensor.

14. The fast food service window set forth in claim 13 wherein the proximity sensor comprises an LED emitter and a receiver and wherein the ring rises